NOTES ON THE BIONOMICS AND MORPHOLOGY OF *HYPOSIDRA SUCCESSARIA* WLK., A GEOMETRID PEST ON DAINCHA (*SESBANIA ACULEATA*) IN COIMBATORE

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(*With a text figure*)

Introduction

Geometridae are seldom pests on cultivated crops, though there are over 1,000 species in the Indian region. These are mostly denizens of the forests and hilly regions. Many of them often stray into the plains and are occasionally recorded in small numbers as larvae or adults, but there are very few instances of these ordinarily multiplying to pest proportions. Of the few recorded as pests in South India, mention may be made of *Buzura* (*Biston*) *suppressaria* G. on tea (Fletcher 1914 and Ayyar, T. V. Ramakrishna 1940), *Semiothisa pervolgata* Wlk. (Cherian and Rangiah Pillai 1938) on Daincha, and *Chloroclystis* sp. (Padmanabha Ayyar 1943) on inflorescence of mango. More recently, in the course of their investigations and studies on Geometrid larvae, a few more caterpillars, namely *Thalassodes* (*Oenospila*) *flavifusata* Wlk. and *Thalassodes immisariopalina* B. on *Eugenia*, *Pseudoterpna* species on *Zizyphus* and *Hyposidra successaria* Wlk. on Daincha, have been collected and reared by the authors. Of these latter, the form *Hyposidra successaria* Wlk. is found to occur in Coimbatore quite regularly on its host plants of which Daincha appears to be the most important. The insect occurs alone or in company with *Semiothisa* on Daincha crop, and the caterpillar is found capable of doing notable damage to the foliage. The economic importance was brought to light, when large numbers of these caterpillars appeared in the above green manure crop for the last two years during which damage by *Semiothisa* was not conspicuous. The caterpillar *Hyposidra* shows some interesting features in its morphology and general habits and the observations so far made are noted below, together with suggestions for control of the pest.

Host Plants: Stray caterpillars of *Hyposidra* have been collected and found to breed on a variety of plants such as rose, castor, cabbage, sugarcane, *Euphorbia hirta*, Chittagathi, and in large numbers on Daincha. The insect in nature multiplies to pest scale on Daincha only. Under laboratory cages, it has been successfully reared on the leaves of both castor and Daincha.

The Moth: *Hyposidra successaria* Wlk. belongs to the subfamily Boarmiinae. The moth is fairly big having a wing expanse of 6 cm. for female, 4 cm. for male and showing varying shades of chocolate-brown and brick-red colour. The antennae of the male are pectinate. In general build the female moth is stout and large as compared to the male specimen (figs. 5, 6). A brief description referring to this moth (Hampson, F. B. I.—Moths, Vol. III, p. 214) is as follows:—

'Female with the outer margin of hind wing produced to points at the veins. Male, with the outer margin of neither wing excised. Antennae pectinated. Postmedial line on underside slightly sinuous, not crenulate. Habitat, throughout India, Ceylon and Burma; Java. Expanse ♂ 42, ♀ 60 millim.'

Life History and Habits

The moths copulate the next day after emergence from the pupae, and the female lays eggs in groups on the surface of the leaves of the host plant (vide fig. 1). Each female moth is capable of laying about 250-300 eggs which it does in batches in the course of 5 or 6 days. The tiny caterpillars come out in 5-6 days' time. The larvae are very active even from the first day and show a tendency to climb up and move about, with characteristic looping motion to reach all portions of the plant. They feed at first by scraping green matter on tender leaves, and during later stages cut edges or feed on entire leaflets leaving only the thicker veins and midribs. The caterpillar is smooth and black during first two stages, showing change in colour to brick-red in later stages of growth. The larvae feed voraciously on the foliage, and when occurring in large numbers on Daincha, reduce the foliage to mere stalks skeletonising the crop. With larval period ranging from 15 to 21 days, the full-grown caterpillar pupates in the soil without any silken cocoon. The moth emerges in about a week and the life cycle from egg to adult is completed in about a month, as noted in the course of a few rearings recorded below:—

Table showing life cycle of *Hyposidra successaria* Wlk. reared on Daincha

Date of egg laying	Date of hatching	Date of pupation	Date of emergence	Total period in life cycle
19-9-51	23-9-51	11-10-51	19-10-51	30 days
do.	do.	10-10-51	19-10-51	30 do.
do.	do.	11-10-51	18-10-51	29 do.
do.	do.	12-10-51	20-10-51	31 do.
do.	do.	11-10-51	19-10-51	30 do.
do.	do.	12-10-51	20-10-51	31 do.
do.	do.	11-10-51	19-10-51	30 do.
do.	do.	11-10-51	19-10-51	30 do.
27-3-52	31-3-52	15-4-52	23-4-52	28 do.
do.	do	17-4-52	25-4-52	29 do.
do.	do.	18-4-52	25-4-52	29 do.
do.	do.	20-4-52	27-4-52	30 do.

DESCRIPTION OF STAGES:

1. Egg: The egg is oval in shape with either end blunt. It measures about 1 mm. and is greenish and soft (fig. 2).

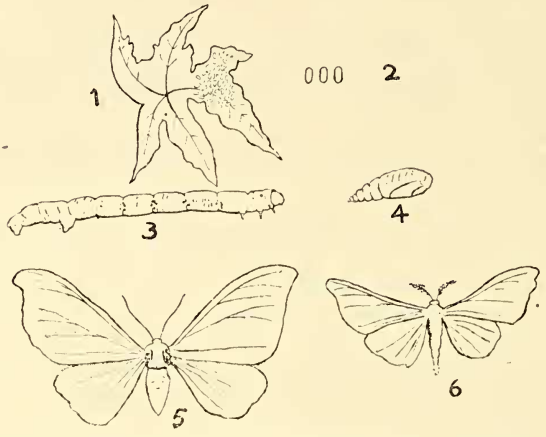
2. Larva: (i) *First Stage.*—The newly-hatched larva is about 0.6 mm. long, and deep black in colour with 5 white cross bands on the abdomen. The body is slender with head as broad or slightly broader than body segments. Hairs or setae are sparse, both on head and body. A few yellowish spots are found on the mid-dorsal area and the ventrolateral region.

(ii) *Second Stage.*—The caterpillar is about 1.3 cm. and soon grows to bigger size. The slender smooth black coloured body shows five white transverse intersegmental stripes in the anterior abdominal region, now in more pronounced manner. The black head bears inconspicuous ocelli at the sides, and pale brown labrum below, the latter being distinctly marked out from the black clypeus. The three pairs of thoracic legs are also black and are directed forwards, with pale brown claws. The prolegs are two pairs only, shown on the 6th and 10th abdominal segments. They are fairly stout with plant-bearing crochets broad and tipped brownish. The growing larva looks entirely black, but for the presence of the characteristic white transverse stripes across thorax and abdomen. Each cross stripe is made up of four white elongated shining spots. The stripes, one on the anterior border of the prothorax and 5 on the posterior borders of the first five abdominal segments are distinct. The prothoracic cross band ends on either side below in a cluster of 2 or 3 dots which appear partly fused together. Short inconspicuous hairs are present on the head and body. The ventral side of the larva is dusky black without dots.

(iii) *Third Stage.*—The caterpillar now measuring 2 cm. has the head slightly bigger than the girth of the body. The head is dull black due to mottlings. The frontal area on the head, is slightly depressed and pale coloured, and the adfrontal area is thin and narrow. The general body colour is dull black. Transverse white dotted cross lines persist over the prothorax and the first five abdominal segments. Paired brick-red spots, placed immediately behind white cross bands on the mid-dorsal region, are seen clearly on the prothorax and on segments 1, 2, 3 and 9 of the abdomen. The lateral clusters of dots are also changed to reddish tint. The spiracles are visible as black specks.

(iv) *Fourth Stage.*—The caterpillar about 2.3 cm. grows bigger with active feeding. The head, dull black, is slightly smaller in size than the thickness of the body segments. More important change is in the colour pattern. The transverse white bands on the 1st thoracic, and the 2nd and 5th abdominal segments are reduced and faint, while those on the 1st, 3rd and 4th abdominal segments are thick and clear. Red dots more in number than in previous stages, are seen dorsally on the thoracic and abdominal segments. Lateral red dots are also conspicuous in all segments except in the 2nd and 9th abdominal segments. The general body colour tends to be brownish. The

spiracles on the thorax and on the 8th segment, appear larger than the rest, each having a central pale area bounded by a black rim.



1. A castor leaf showing eggs on it; 2. Three eggs magnified; 3. A full-grown caterpillar; 4. Pupa; 5. Moth (female); 6. Moth (male).

(v) *Fifth Stage*.—The full-grown larva (fig. 3) attains a length of 3-3½ cm. The colour is pinkish or dark brown or brick red. The transverse band formed by white linear spots persists, with brownish or brick red patches at the sides. Paired brown dots are prominent dorsally on 2nd and 5th abdominal segments. The body is stout cylindrical, and its surface smooth and devoid of tubercles. The setae, barely seen at the sides, are in the form of very thin and short hairs. The head region is smaller, shiny, smooth and faintly marked with mottlings and black ocelli. Legs are dark brown, and prolegs stout and strong to support the body off the substratum. The caterpillar at this stage, is most active in feeding and movement. The looper marches from plant to plant with great alacrity, and occasionally remains erect, resting on its prolegs, and simulating bare twig.

3. Pupa: The full-grown caterpillar, prior to pupation, ceases feeding, drops to the ground, suffers reduction in size by shrinkage and undergoes its last moult lying in the midst and shelter of fallen leaves. The pupa is dark brown, oval and measuring about 1 cm. in length and gives emergence to the moth in about 8-9 days (fig. 4).

The Status of the Pest and Suggestions for its Control

Next to *Semiothisa*, the recently noted *Hyposidra* is the most serious caterpillar pest, defoliating Daincha crop in Coimbatore. The caterpillar, especially when in large numbers, can easily be recognised by the colour, posture and looping movement. The symptoms of damage are characteristic. It may occur alone or in combination with *Semiothisa*, which it resembles in general habits and external features to a great extent. *Hyposidra* is distinguishable from *Semiothisa* by

the size and colour pattern. *Hyposidra* grows bigger in size, is devoid of tubercles, and is coloured black in the early stages and brick-red in the final stages, with cross markings. The caterpillar *Semiothisa*, on the other hand, is smaller, pale to dark green in colour and having on its body surface minute black tubercles bearing short hairs, at the same time showing no marked colour changes or cross markings except for two black spots borne on the 2nd abdominal segment lasting up to the fourth stage.

Application of a 5% BHC or DDT dust, at the rate of 15 lb. per acre, effectively controls both these pests.

References

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